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I U C L I D

Data Set

Existing Chemical	:	ID: 3757-76-4
CAS No.	:	3757-76-4
Generic name	:	2,4-Dichlorophenol sodium salt

Producer Related Part

Company	:	The Dow Chemical Company
Creation date	:	24.01.2002

Substance Related Part

Company	:	The Dow Chemical Company
Creation date	:	24.01.2002
Memo	:	
Printing date	:	25.01.2002
Revision date	:	
Date of last Update	:	25.01.2002
Number of Pages	:	4
Chapter (profile)	:	
Reliability (profile)	:	
Flags (profile)	:	???

1.0.1 OECD AND COMPANY INFORMATION

Type	**:**	cooperating company
Name	**:**	The Dow Chemical Company
Partner	**:**	
Date	**:**	
Street	**:**	2020 Dow Center
Town	**:**	48674 Midland, Michigan
Country	**:**	United States
Phone	**:**	
Telefax	**:**	
Telex	**:**	
Cedex	**:**	

25.01.2002

1.0.2 LOCATION OF PRODUCTION SITE

1.0.3 IDENTITY OF RECIPIENTS

1.1 GENERAL SUBSTANCE INFORMATION

1.1.0 DETAILS ON TEMPLATE

1.1.1 SPECTRA

1.2 SYNONYMS

1.3 IMPURITIES

1.4 ADDITIVES

1.5 QUANTITY

1.6.1 LABELLING

1.6.2 CLASSIFICATION

1.7 USE PATTERN

1.7.1 TECHNOLOGY PRODUCTION/USE

1.8 OCCUPATIONAL EXPOSURE LIMIT VALUES

1.9 SOURCE OF EXPOSURE

1.10.1 RECOMMENDATIONS/PRECAUTIONARY MEASURES

1.10.2 EMERGENCY MEASURES

1.11 PACKAGING

1.12 POSSIB. OF RENDERING SUBST. HARMLESS

1.13 STATEMENTS CONCERNING WASTE

1.14.1 WATER POLLUTION

1.14.2 MAJOR ACCIDENT HAZARDS

1.14.3 AIR POLLUTION

1.15 ADDITIONAL REMARKS

1.16 LAST LITERATURE SEARCH

1.17 REVIEWS

1.18 LISTINGS E.G. CHEMICAL INVENTORIES

2.1 MELTING POINT

Decomposition : yes at = 305 ° C
Sublimation :
Method : OECD Guide-line 102 "Melting Point/Melting Range"
Year : 2002
GLP : yes
Test substance : other TS
Test substance : 99.9% purity
Reliability : (1) valid without restriction
25.01.2002 (1)

2.2 BOILING POINT

Decomposition : yes
Method : OECD Guide-line 103 "Boiling Point/boiling Range"
Year : 2002
GLP : yes
Test substance : other TS
Test substance : 99.9% Purity
Reliability : (1) valid without restriction
25.01.2002 (2)

2.3 DENSITY

2.3.1 GRANULOMETRY

2.4 VAPOUR PRESSURE

Value : < .0000000002 hPa at 20° C
Decomposition : no
Method other (calculated)
Year : 2002
GLP : yes
Test substance : other TS
Decomposition : no
Test substance : 99.9% purity
Reliability : (1) valid without restriction
25.01.2002 (2)

2.5 PARTITION COEFFICIENT

Log pow : = .12 at 20° C
Method other (calculated)
Year : 2002
GLP : yes
Test substance : other TS
Test substance : 99.9% purity
Reliability : (1) valid without restriction
25.01.2002 (1)

2.6.1 WATER SOLUBILITY

Value : = 6.04 g/l at 20 ° C
Qualitative : of high solubility
Pka : 7.8 at 25 ° C
PH : = 4 at and ° C
Method : OECD Guide-line 105 "Water Solubility"
Year : 2002
GLP : yes
Test substance : other TS
Remark : pKa is same as noted for 2,4-dichlorophenol.
Result : Water Solubility (at 20 C)

pH 4= 6.04 g/L
pH 7= 7.05 g/L
pH 10= 142 g/L
Unbuffered > 500 g/L

As evident by the high water solubility in unbuffered water (>500 g/L) and as expected for a salt (by definition), the test substance completely dissociates in water.

Therefore, the acid dissociation constant (pKa) for sodium salt of 2,4-dichlorophenol is the same as for 2,4-dichlorophenol.

Test substance : 99.9% purity
Reliability : (1) valid without restriction
25.01.2002 (1)

2.6.2 SURFACE TENSION

2.7 FLASH POINT

2.8 AUTO FLAMMABILITY

2.9 FLAMMABILITY

2.10 EXPLOSIVE PROPERTIES

2.11 OXIDIZING PROPERTIES

2.12 ADDITIONAL REMARKS

3.1.1 PHOTODEGRADATION

3.1.2 STABILITY IN WATER

3.1.3 STABILITY IN SOIL

3.2 MONITORING DATA

3.3.1 TRANSPORT BETWEEN ENVIRONMENTAL COMPARTMENTS

3.3.2 DISTRIBUTION

3.4 MODE OF DEGRADATION IN ACTUAL USE

3.5 BIODEGRADATION

3.6 BOD5, COD OR BOD5/COD RATIO

3.7 BIOACCUMULATION

3.8 ADDITIONAL REMARKS

4.1 ACUTE/PROLONGED TOXICITY TO FISH

Remark : 2,4-Dichlorophenol (2,4DCP) exhibits acute aquatic toxicity (LC50's in fish and EC50's in algae and Daphnia) between 1 and 10 mg/L. The sodium salt of 2,4DCP (2,4DCP-Na) will exhibit essentially equivalent toxicity values because the aquatic chemistry of these two chemical forms are essentially equivalent. First, the solubility of 2,4DCP (4000 mg/L; 25 mM) and 2,4DCP-Na (7050 mg/L; 38 mM) indicate that both forms are freely soluble at the concentrations encountered in the aquatic toxicity tests conducted on 2,4DCP (<100 mg/L). Both chemical forms exhibit high solubility because they readily dissociate in aqueous solution. The aqueous dissociation constant (pKa) for 2,4-DCP has been reported to range from 7.6 to 7.89, suggesting that at pH values likely to be encountered in aquatic testing facilities (pH = 7 to 8.5 at total alkalinities of 50 to 100 mg/L CaCO3), the majority of the 2,4-DCP is likely to be in the anionic (phenoxide) form. Furthermore, this speciation is not significantly affected by the starting form of the test material (sodium salt of phenol) because these forms readily dissociate in solution to yield the phenoxide anion. To confirm this, the dissociation of 2,4-DCP and 2,4-DCP-Na and the effect of this dissociation on equilibrium pH was modeled using the USEPA computer program, MINTEQA2 version 3, a geochemical equilibrium and speciation model (Allison et al. 1991). An aqueous solution consisting of 50 mg/L CaCO3 in equilibrium with the atmosphere (pCO2=3x10-4 atm) was modeled containing 0, 10 and 100 mg/L 2,4-DCP and 0, 10 and 100 mg/L 2,4-DCP-Na (Appendix 1). In the absence of 2,4-DCP or 2,4-DCP-Na, MINTEQA2 calculated the equilibrium pH to be 8.27, consistent with the pH buffering ability of carbonate alkalinity in water (Stumm and Morgan, 1981; p. 183). MINTEQA2 calculated that addition of 10 mg/L or 100 mg/L 2,4-DCP would result in a very minimal pH change (pH=8.315, pH=8.339, respectively) and nearly identical aqueous speciation (74% phenoxide anion; 75% phenoxide anion, respectively). Addition of 10 mg/L or 100 mg/L 2,4-DCP-Na results in equivalent equilibrium pH (pH=8.336, pH=8.337, respectively) and equivalent aqueous speciation (both yield 75% phenoxide anion). Thus, regardless of whether that sodium salt of 2,4-DCP or the phenol form of 2,4-DCP are added to aqueous solutions, the same speciation occurs in solution. Therefore, aquatic toxicity testing of the sodium salt of 2,4-DCP would yield results equivalent to that already achieved in the testing of 2,4-DCP.

Reliability : (1) valid without restriction

25.01.2002 (3) (4)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

Method :

Year : 2002

GLP :

Test substance :

Remark : 2,4-Dichlorophenol (2,4DCP) exhibits acute aquatic toxicity (LC50's in fish and EC50's in algae and Daphnia) between 1 and 10 mg/L. The sodium salt of 2,4DCP (2,4DCP-Na) will exhibit essentially equivalent toxicity values because the aquatic chemistry of these two chemical forms are essentially equivalent. First, the solubility of 2,4DCP (4000 mg/L; 25 mM) and 2,4DCP-Na (7050 mg/L; 38 mM) indicate that both forms are freely soluble at the concentrations encountered in the aquatic toxicity tests conducted on 2,4DCP (<100 mg/L). Both chemical forms exhibit high solubility because they readily dissociate in aqueous solution. The aqueous dissociation constant (pKa) for 2,4-DCP has been reported to range from 7.6 to 7.89, suggesting that at pH values likely to be encountered in aquatic testing facilities (pH = 7 to 8.5 at total alkalinities of 50 to 100 mg/L CaCO3), the majority of the 2,4-DCP is likely to be in the anionic (phenoxide) form. Furthermore, this speciation is not significantly affected by the starting form of the test material (sodium salt of phenol) because these forms readily dissociate in solution to yield the phenoxide anion. To confirm this, the dissociation of 2,4-DCP and 2,4-DCP-Na and the effect of this dissociation on equilibrium pH was modeled using the USEPA computer program, MINTEQA2 version 3, a geochemical equilibrium and speciation model (Allison et al. 1991). An aqueous solution consisting of 50 mg/L CaCO3 in equilibrium with the atmosphere (pCO2=3x10-4 atm) was modeled containing 0, 10 and 100 mg/L 2,4-DCP and 0, 10 and 100 mg/L 2,4-DCP-Na (Appendix 1). In the absence of 2,4-DCP or 2,4-DCP-Na, MINTEQA2 calculated the equilibrium pH to be 8.27, consistent with the pH buffering ability of carbonate alkalinity in water (Stumm and Morgan, 1981; p. 183). MINTEQA2 calculated that addition of 10 mg/L or 100 mg/L 2,4-DCP would result in a very minimal pH change (pH=8.315, pH=8.339, respectively) and nearly identical aqueous speciation (74% phenoxide anion; 75% phenoxide anion, respectively). Addition of 10 mg/L or 100 mg/L 2,4-DCP-Na results in equivalent equilibrium pH (pH=8.336, pH=8.337, respectively) and equivalent aqueous speciation (both yield 75% phenoxide anion). Thus, regardless of whether that sodium salt of 2,4-DCP or the phenol form of 2,4-DCP are added to aqueous solutions, the same speciation occurs in solution. Therefore, aquatic toxicity testing of the sodium salt of 2,4-DCP would yield results equivalent to that already achieved in the testing of 2,4-DCP.

Reliability : (1) valid without restriction

25.01.2002 (3) (4)

4.3 TOXICITY TO AQUATIC PLANTS E.G. ALGAE

Method :

Year : 2002

GLP :

Test substance :

Remark : 2,4-Dichlorophenol (2,4DCP) exhibits acute aquatic toxicity (LC50's in fish and EC50's in algae and Daphnia) between 1 and 10 mg/L. The sodium salt of 2,4DCP (2,4DCP-Na) will exhibit essentially equivalent toxicity values because the aquatic chemistry of these two chemical forms are essentially equivalent. First, the solubility of 2,4DCP (4000 mg/L; 25 mM) and 2,4DCP-Na (7050 mg/L; 38 mM) indicate that both forms are freely soluble at the concentrations encountered in the aquatic toxicity tests conducted on 2,4DCP (<100 mg/L). Both chemical forms exhibit high solubility because they readily dissociate in aqueous solution. The aqueous dissociation constant (pKa) for 2,4-DCP has been reported to range from 7.6 to 7.89, suggesting that at pH values likely to be encountered in aquatic testing facilities (pH = 7 to 8.5 at total alkalinities of 50 to 100 mg/L CaCO3), the majority of the 2,4-DCP is likely to be in the anionic (phenoxide) form. Furthermore, this speciation is not significantly affected by the starting form of the test material (sodium salt of phenol) because these forms readily dissociate in solution to yield the phenoxide anion. To confirm this, the dissociation of 2,4-DCP and 2,4-DCP-Na and the effect of this dissociation on equilibrium pH was modeled using the USEPA computer program, MINTEQA2 version 3, a geochemical equilibrium and speciation model (Allison et al. 1991). An aqueous solution consisting of 50 mg/L CaCO3 in equilibrium with the atmosphere (pCO2=3x10-4 atm) was modeled containing 0, 10 and 100 mg/L 2,4-DCP and 0, 10 and 100 mg/L 2,4-DCP-Na (Appendix 1). In the absence of 2,4-DCP or 2,4-DCP-Na, MINTEQA2 calculated the equilibrium pH to be 8.27, consistent with the pH buffering ability of carbonate alkalinity in water

(Stumm and Morgan, 1981; p. 183). MINTEQA2 calculated that addition of 10 mg/L or 100 mg/L 2,4-DCP would result in a very minimal pH change (pH=8.315, pH=8.339, respectively) and nearly identical aqueous speciation (74% phenoxide anion; 75% phenoxide anion, respectively). Addition of 10 mg/L or 100 mg/L 2,4-DCP-Na results in equivalent equilibrium pH (pH=8.336, pH=8.337, respectively) and equivalent aqueous speciation (both yield 75% phenoxide anion). Thus, regardless of whether that sodium salt of 2,4-DCP or the phenol form of 2,4-DCP are added to aqueous solutions, the same speciation occurs in solution. Therefore, aquatic toxicity testing of the sodium salt of 2,4-DCP would yield results equivalent to that already achieved in the testing of 2,4-DCP.

Reliability : (1) valid without restriction

25.01.2002 (3) (4)

4.4 TOXICITY TO MICROORGANISMS E.G. BACTERIA

4.5.1 CHRONIC TOXICITY TO FISH

4.5.2 CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

4.6.1 TOXICITY TO SOIL DWELLING ORGANISMS

4.6.2 TOXICITY TO TERRESTRIAL PLANTS

4.6.3 TOXICITY TO OTHER NON-MAMM. TERRESTRIAL SPECIES

4.7 BIOLOGICAL EFFECTS MONITORING

4.8 BIOTRANSFORMATION AND KINETICS

4.9 ADDITIONAL REMARKS

5.1.1 ACUTE ORAL TOXICITY

5.1.2 ACUTE INHALATION TOXICITY

5.1.3 ACUTE DERMAL TOXICITY

5.1.4 ACUTE TOXICITY, OTHER ROUTES

5.2.1 SKIN IRRITATION

5.2.2 EYE IRRITATION

5.3 SENSITIZATION

5.4 REPEATED DOSE TOXICITY

5.5 GENETIC TOXICITY ‘IN VITRO‘

5.6 GENETIC TOXICITY ‘IN VITRO‘

5.7 CARCINOGENITY

5.8 TOXICITY TO REPRODUCTION

5.9 DEVELOPMENTAL TOXICITY/TERATOGENICITY

5.10 OTHER RELEVANT INFORMATION

5.11 EXPERIENCE WITH HUMAN EXPOSURE

(1) Unpublished data, Dow Agrosciences LLC.

(2) Unpublished data, Dow Agrosciences LLC

(3) Allison, J.D., D.S. Brown and K.S. Novo-Gradac. 1991. MINTEQA2/PRODEFA2: A Geochemical Assessment Model for Environmental Systems. EPA/600/3-91/021. Assessment Branch, Environmental Research Laboratory, Athens, GA, USA.

(4) Stumm, W. and J.J. Morgan. 1981. Aquatic Chemistry: An Introduction Emphasizing Chemical Equilibria in Natural Waters, 2nd Edition. John Wiley and Sons, Inc. New York. p. 183.

7.1 END POINT SUMMARY

Chapter : 4
Remark : 2,4-Dichlorophenol (2,4DCP) exhibits acute aquatic toxicity (LC50's in fish and EC50's in algae and Daphnia) between 1 and 10 mg/L. The sodium salt of 2,4DCP (2,4DCP-Na) will exhibit essentially equivalent toxicity values because the aquatic chemistry of these two chemical forms are essentially equivalent. First, the solubility of 2,4DCP (4000 mg/L; 25 mM) and 2,4DCP-Na (7050 mg/L; 38 mM) indicate that both forms are freely soluble at the concentrations encountered in the aquatic toxicity tests conducted on 2,4DCP (<100 mg/L). Both chemical forms exhibit high solubility because they readily dissociate in aqueous solution. The aqueous dissociation constant (pKa) for 2,4-DCP has been reported to range from 7.6 to 7.89, suggesting that at pH values likely to be encountered in aquatic testing facilities (pH = 7 to 8.5 at total alkalinities of 50 to 100 mg/L CaCO3), the majority of the 2,4-DCP is likely to be in the anionic (phenoxide) form. Furthermore, this speciation is not significantly affected by the starting form of the test material (sodium salt of phenol) because these forms readily dissociate in solution to yield the phenoxide anion. To confirm this, the dissociation of 2,4-DCP and 2,4-DCP-Na and the effect of this dissociation on equilibrium pH was modeled using the USEPA computer program, MINTEQA2 version 3, a geochemical equilibrium and speciation model (Allison et al. 1991). An aqueous solution consisting of 50 mg/L CaCO3 in equilibrium with the atmosphere (pCO2=3x10-4 atm) was modeled containing 0, 10 and 100 mg/L 2,4-DCP and 0, 10 and 100 mg/L 2,4-DCP-Na (Appendix 1). In the absence of 2,4-DCP or 2,4-DCP-Na, MINTEQA2 calculated the equilibrium pH to be 8.27, consistent with the pH buffering ability of carbonate alkalinity in water (Stumm and Morgan, 1981; p. 183). MINTEQA2 calculated that addition of 10 mg/L or 100 mg/L 2,4-DCP would result in a very minimal pH change (pH=8.315, pH=8.339, respectively) and nearly identical aqueous speciation (74% phenoxide anion; 75% phenoxide anion, respectively). Addition of 10 mg/L or 100 mg/L 2,4-DCP-Na results in equivalent equilibrium pH (pH=8.336, pH=8.337, respectively) and equivalent aqueous speciation (both yield 75% phenoxide anion). Thus, regardless of whether that sodium salt of 2,4-DCP or the phenol form of 2,4-DCP are added to aqueous solutions, the same speciation occurs in solution. Therefore, aquatic toxicity testing of the sodium salt of 2,4-DCP would yield results equivalent to that already achieved in the testing of 2,4-DCP.
Reliability : (1) valid without restriction
25.01.2002

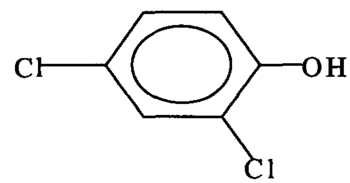
Chapter : 5
Remark : The solubility of 2,4DCP (4000 mg/L; 25 mM) and 2,4DCP-Na (7050 mg/L; 38 mM) indicate that both forms are freely soluble at the concentrations likely to be encountered in mammalian testing. Both chemical forms exhibit high solubility because they readily dissociate in aqueous solution. The aqueous dissociation constant (pKa) for 2,4-DCP has been reported to range from 7.6 to 7.89, suggesting that at pH values likely to be encountered in the mammalian intestinal tract, the majority of the 2,4-DCP is likely to be in the anionic (phenoxide) form. Furthermore, this speciation is not significantly affected by the starting form of the test material (sodium salt of phenol) because these forms readily dissociate in solution to yield the phenoxide anion. Thus, regardless of whether that sodium salt of 2,4-DCP or the phenol form of 2,4-DCP are added to aqueous solutions, the same speciation occurs in solution. Therefore, mammalian toxicity testing of the sodium salt of 2,4-DCP would yield results equivalent to that already achieved in the testing of 2,4-DCP.
Reliability : (1) valid without restriction

25.01.2002

7.2 HAZARD SUMMARY

7.3 RISK ASSESSMENT

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	120-83-2
Chemical Name	2,4-Dichlorophenol
Structural Formula	

SUMMARY CONCLUSIONS OF THE SIAR

Human Health

Free 2,4-dichlorophenol (2,4-DCP) does not accumulate in tissues. 2,4-DCP is a strong uncoupler for oxidative phosphorylation. It is rapidly metabolised into its glucuronate conjugate, its major metabolite, and is mainly excreted in this form via urine.
The acute oral toxicity is low: LD50 1276-1352 mg/kg b.w. when tested in CD 1 mice. The dermal toxicity is moderate: LD_{50} in Sprague Dawley rats was 780 mg/kg with molten substance at 40°C. Further occupational deaths have been reported in five cases. Accidents generally occurred in the same way: workers died after being sprayed with molten (60°C) 2,4-dichlorophenol. US-EPA concludes that contact with only 1% of the body surface may lead to death. The skin irritation tests with 2,4-dichlorophenol reports the substance to be "corrosive" to skin and risk of serious damage to the eyes is expected.

The skin sensitisation potential has not been assessed. Its evaluation may be considered as unwanted due to the necessity to avoid contact with corrosive materials. Chloracnea appears at human exposure to a mixture of chlorophenols containing 2,4-dichlorophenol.

The 2-year study (Fischer 344 rat) was chosen to establish an overall NOAEL, after prolonged treatment with 2,4-dichlorophenol, of 440 mg/kg bw/d for male and above 250 mg/kg bw/d for female, which is in agreement with the findings in the other studies. In a 90 days repeated dose toxicity study dietary administration produced bone marrow degeneration at about 800 mg/kg bw/d in females or at 1500 mg/kg bw/d in males; at 3000 mg/kg bw/d these effects were not seen. The general appearance was affected at the top dose of 3000 mg/kg bw/d.

The genetic toxicity is assessed by *in vitro* and *in vivo* studies. *In vitro*, most of the test results were negative. An *in vivo* micronucleus test, an unscheduled DNA synthesis test and two sister chromatid exchange assays were all negative. It is concluded that the material is not genotoxic as the results of the *in vivo* tests are negative.

No evidence of carcinogenic activity was reported in rat and in mouse exposed orally for two years. These results are supported by the conclusion of the IARC: although polychlorophenols and their salts are classified in group 2B, there is evidence suggesting lack of carcinogenicity of 2,4-DCP in experimental animals (IARC, 1999).

In a one-generation study, no effect was observed via drinking water at 500 mg/kg bw/d in mice. A non-conventional one-generation study with rats using dose levels up to 15 mg/kg bw/d did not show any significant effect on reproduction parameters. The only significant effect was an increase of some hematologic parameters (red blood cell and hemoglobin), in the F1 generation at 15 mg/kg bw/d, observed after a 14 month exposure. *In vitro* studies showed no effect on penetration of sperm in mouse ova.

There were no teratogenic effects observed in rats exposed by gavage at doses up to 750 mg/kg bw/d. The NOAEL for maternal effects is <200 mg/kg bw/d, (lowest dose tested) and the NOAEL for foetal effects is 375 mg/kg bw/d.

In these studies considering developmental toxicity and teratogenicity, 2,4-dichlorophenol has been reported to have toxic effects on foetuses at dose levels causing maternal effects (decrease in the litter size, delayed fetal development, increase in the organ weights).

The hormone disruption potency of 2,4-DCP was shown in only one *in vitro* test considered to be invalid. In another *in vitro* tests on estrogenic activity (competitive binding and response to proliferation culture) results were negative. Results were also negative in two *in vivo* tests (a uterotrophic assay and a Hershberger assay). A two generation reproductive study of 2,4-DCP is now underway in Japan (METI). By incorporating the results of this study into existing findings, the endocrine disruption effects of 2,4-DCP will be comprehensively assessed.

Environment

2,4-DCP is a white solid in crystal or needle forms. It has a low vapour pressure at room temperature (0.16 hPa at 25 °C). The water solubility of 2,4-DCP is 4.5 g/l at 25 °C, but since the pKa is 7.89, which falls in the pH range of environmental waters (approximately 6-9), the extent of dissociation of 2,4-DCP may vary significantly. The measured log Pow is 3.21-3.25 at 20°C.

Based on its vapour pressure, 2,4-DCP is expected to have a low volatility from dry soil surfaces. In contrast, photodegradation should be an important means of removing 2,4-DCP from clear surface water. Atmospheric oxidation half-life is estimated by QSAR to be 3.6 days. Hydrolysis is not expected to occur: halogenated aromatics and phenols are generally resistant to hydrolysis. Mechanisms other than photodegradation and microbial degradation, as adsorption by organic matter present within the sediments, catalysis at the surface of silica or oxidation, may also be involved in the disappearance of 2,4-DCP from water. Since the pKa is around 7.8, 2,4-DCP will exist in water and sediment in a partially dissociated state which may affect its transport and reactivity. Similarly in soil, the ionised form (in alkaline soil) is poorly adsorbed, whereas the neutral form (acid soil) is expected to undergo more adsorption. Adsorption will also increase with increasing organic matter content.

Biodegradation studies have shown that 2,4-DCP was not readily biodegradable, but it was inherently degradable only in the presence of adapted microflora, both in aerobic and anaerobic conditions. Anaerobic degradation of 2,4-DCP produced 4-chlorophenol as the major product. The BCFs of 7.1 to 69 in carp suggest that bioaccumulation in aquatic organisms is low.

Aquatic effects

In acute toxicity studies, the lowest LC_{50} values are 1.7 mg/L for freshwater fish and 1.4 mg/l for *Daphnia magna*. For aquatic plants, results on Lemna are available, leading to EC_{50} (7d) = 1.5 mg/L (endpoint: vegetative frond reproduction). In chronic toxicity studies, a NOEC of 0.29 mg/l for a fish, of 0.41 mg/L for Lemna (endpoint: vegetative frond reproduction) and a NOEC of 0.21 mg/l (endpoint: reproductivity rate) for *Daphnia magna* have been obtained. In a non-standard valid test on net spinning behaviour of the Trichoptera larvae, A LOEC value of 0.0035 mg/l was derived.

Despite the numerous consistent data available on fish, Daphnia and algae, issued from acute and chronic toxicity studies, due to the uncertainties on ecological relevance of the endpoint of the Trichoptera study, no final decision was made regarding PNEC derivation.

Tests with activated sludge resulted in EC50 values of 32 – 73 mg/l. Tests with *Pseudomonas putida* and *Tetrahymena pyriformis* resulted in EC50 values of 133 and 4.5 – 12.6 mg/l, respectively. Test with nitrifying bacteria resulted in a EC50 value of 0.15 mg/l. This latter value could be used for the derivation of a PNEC.

Terrestrial effects

The LC50 for earthworm is 125 mg/kg dw and for plants the EC50 is 316 mg/kg dw. The EC10 in a 34 day test with *Folsomia candida* was 0.7 mg/kg dw.

Exposure

The production volume of 2,4-dichlorophenol was 2000 to 5000 tonnes per year in France.

The use is non-dispersive, as an intermediate for synthesis in chemical industry. The product is not dispersed or transported outside of the site in the Sponsor country, the process functions in a closed system. The principle hazard for manufacturers or users can be burns by accidents at debottlenecking with a temperature higher than 60°C. In closed systems if there is a leak the penetrating odour of 2,4-dichlorophenol gives an alert.

The possible sources of 2,4-DCP in the environment are through the degradation of 2,4-D (2,4-dichlorophenoxy acetic acid, herbicide), or potentially chlorination of phenol-containing water.

RECOMMENDATION

The chemical is currently of low priority for further work.

RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

Human Health and Environment

The chemical possesses properties indicating a hazard for human health and the environment. Based on data presented by the Sponsor country, exposure to humans and the environment is anticipated to be low, and therefore this chemical is currently of low priority for further work in the SIDS Programme. Countries may desire to investigate any exposure scenarios that were not presented by the Sponsor country. The main source for 2,4-DCP measured in the environment appears to be through degradation of the pesticide 2,4-D.

In other programmes: a two generation study in rat is under-way to complete the assessment of its endocrine disrupter potential (METI, Japan) and for the environment, an EU evaluation (in relation to the Community Strategy for Endocrine Disrupters) is ongoing.